BOAT AND RAFT SAFETY

Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the boating and water safety steps that must be followed when conducting the fish sampling activities in selected reservoirs and the Rio Grande, as part of the routine Environmental Surveillance Program to determine background levels of potential environmental contaminants and to detect any above-background concentrations caused by Laboratory activities.

Scope

This procedure applies to the individual(s) assigned to collect fish samples as part of the Foodstuffs Monitoring Program.

In this procedure

This procedure addresses the following major topics:

Hazard Control Plan

The hazard evaluation associated with this work is documented in Attachment 1: Initial risk = **medium**. Residual risk = **low.** Work permits required: none. First authorization review date is one year from group leader signature below; subsequent authorizations are on file in group office.

Signatures

Prepared by: Phil Fresquez, Environmental Surveillance Team Leader	Date: 5/12/04
Approved by: Terry Morgan, QA Officer	Date: 5/12/04
Work authorized by: Jean Dewart, MAQ Group Leader	Date: 5/14/04

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Control Plan	2

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0		Revision number not used.
1	?	New document, issued as ESH-8 group procedure.
2	8/89	Update of procedure.
3	10/91	Update of procedure.
4	5/93	Update of procedure.
5	?	Revised into new format, process updated.
0	10/4/96	New document, issued as ECO group procedure.
1	3/99	Reformatted in accordance with LIR300-00-01, Safe Work Practices.
2	4/01	Added new Section 9.0, Training
3	4/02	Change in directorate.
4	4/03	Team name change to Environmental Surveillance.
5	5/12/04	Updated and reformatted document to conform with MAQ procedures.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- MAQ personnel who use or travel in the boat or raft in rivers or lakes.

Training method

The training method for this procedure is **on-the-job** training by a previously-trained individual and is documented in accordance with the procedure for training (MAQ-024).

Annual retraining is required and will be by self-study (“reading”) training.

Continued on next page.

General information, continued

Prerequisites

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- First Aid
- Cardiopulmonary Resuscitation (CPR)
- MAQ-Field, "General Field Safety for All Employees"

At least one person in each field crew must have the following training:

- New Mexico Boating Safety Class

All personnel must know how to swim.

Definitions specific to this procedure

Electrofishing: The taking of fish by a system based on their tendency to respond positively to a source of direct electric current.

References

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
- MAQ-026, "Deficiency Reporting and Correcting"
- MAQ-Field, "General Field Safety for All Employees"

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Worker safety

Precautions and limitations

This document establishes the basic requirements for boat and raft safety and applies to all personnel performing procedures described in this document.

Safe work practices requirements

Project Personnel - In accordance with the procedure for field work (MAQ-Field) a minimum of two people is required to go out in the field (boat or raft).

Stormy weather - Reschedule or delay work activities as necessary to avoid severe or dangerous weather. High winds and high waves could cause the boat or raft to be swamped or to capsize. Lightning is an extreme threat to personnel on or in the water.

Electrofishing - the electrical energy used in electrofishing is sufficient to cause death by electrocution. Use caution and avoid contact with electrodes and water during operation. See procedure MAQ-702 for electrofishing steps.

Do not perform work under conditions you consider unsafe. Before beginning work described in this procedure, review safety needs and requirements, identify hazards, and develop hazard mitigation measures.

Boat and raft descriptions

Boat description

The group currently uses an 18.5-ft pontoon boat with a 75-hp Mercury Marina motor for fish sampling. The boat has a seven-passenger/990-pound capacity. The boat is transported on a single-axle trailer equipped with running lights and requires a 2-in. ball for towing.

Boat equipment needed

The following equipment is required for using the boat:

- radio, cellular phone, or other radio/telephone
- Coast Guard-approved life jackets for everyone on board
- life ring with 30 ft of rope
- oars
- distress whistle
- adequate fuel
- fire extinguisher

Raft description

The group uses a SR-17 Catacraft Electrofishing craft that has a 1,600-pound capacity/930-pound payload and a four-person capacity. The raft is equipped with 3-chamber Dupont Hypalon inflatable pontoons and is steered with two blade paddles or a 35-hp outboard motor. The boat has a hard deck to provide a secure working platform. The self bailing features ensure a buoyant platform regardless of water taken over the deck. The boat can be rowed with oars. It is rated and certified by the Boating Industry Association. The boat is transported on a single-axle trailer equipped with running lights and requires a 2-in. ball for towing.

Raft equipment needed

The following equipment is required for using the raft:

- paddles
- Coast Guard-approved life jackets for everyone on board
- repair equipment for raft
- cooler with ice
- sampling gear, bottles, and plastic bags
- food, water, and cooking gear
- radio, cellular phone, or other radio/telephone; Handy Talky
- first aid and snake bite kit
- personal gear (sleeping bag, extra clothing, etc.)
- appropriate cold weather clothing, such as polypropylene or even neoprene wetsuits.

Preparing for a sampling trip

Preparing for a trip

At least two trained or experienced people are required for either the boat or raft. At least one person must be experienced in towing and backing trailers and in loading and unloading the boat at the water. All participants must know how to swim and must wear life jackets at all times while on board the boat/raft. Bring sunscreen, rain/ wind gear, and extra clothing in case some gets wet.

Personnel should be familiar with all applicable New Mexico boating regulations.

Ensure that the boat is in good running condition and has been inspected. Ensure that the hitch safety chains are in good condition and that the running lights work.

Collect the equipment listed above, for either the boat or raft, and other equipment needed for the sampling to be performed.

Ensure that the weight of the personnel and equipment does not exceed the boat or raft capacity (990 lbs for the boat or 1,600 lbs for the raft).

Before leaving for the field

Vehicle - Check the condition of the vehicle and the fuel level.

Check the Weather - Check the weather forecast the morning of the sampling trip. If high winds (>20 mph), rain, and/or thunderstorms are predicted, STAY OUT OF THE WATER.

Check the Boat Equipment - Check the following items:

- Ensure that the boat has new gas (eliminates engine problems).
- Check oil injector level.
- Ensure that the battery is charged.
- Ensure that drain plug is in boat.
- Check pontoon for any major damage (i.e., holes or big dents). Air pressure of pontoons shoud be at ~2-1/2 psi.

Departure and itinerary

Before departure, inform the group office of your destination and estimated time of return. For multi-day trips, leave a detailed itinerary and the plans for checking in periodically. When leaving Los Alamos County you must be placed on official Laboratory travel status. If your time of return will be after 4:30 p.m., make arrangements to check in with your supervisor when you return.

Preparing for a sampling trip, continued

Fuel safety

When refueling: Only do refueling OUTDOORS and AFTER the engine has cooled for at least 5 minutes. Carry gas in approved safety gas cans -- MAXIMUM 8 gallons – only in outside beds of vehicles, or in trailer if fuel lines disconnected. Wear safety glasses when refueling. Check engine oil at each refueling. Leave MAX of 17 oz in engine fuel tank.

When filling gas cans: Always put the can ON THE GROUND when adding gas. Cans in the bed of a truck, especially one with a bed liner, are often not grounded and a spark can occur between the gas nozzle and the can. Many fires have occurred this way.

Towing the boat or raft

Towing vehicle

Ensure the vehicle you plan to use to tow is rated to tow the weight of the boat (990 lbs) or the Cataraft (1600 lb). Ensure it has a proper trailer hitch and the correct trailer ball (2”). Always use the safety chains; cross them to attach to hitch.

Hooking and unhooking trailer

Chock **BOTH** trailer wheels before raising the trailer tongue to hook or unhook the trailer from the vehicle. Keep hands and fingers clear and watch for sudden movement. Always use crank tongue lift to raise and lower tongue; remember to swing it to horizontal before towing.

WARNING: As the hitch comes off the ball, the trailer may move. Stand away a foot or more and be ready to move.

Towing

Use extra caution when towing: assume longer stopping distances, use mirrors when changing lanes, be aware of the extra width and length of the vehicle.

At the sampling site

While at the lake or river

Before the activity begins, hold a brief safety meeting.

Notify reservoir officials of your arrival and departure.

Stay seated while boat/rafts are in motion.

Wear life jackets at all times when in the boat or raft.

In case of emergency

Injury - Administer appropriate first aid and provide appropriate transportation of injured person to Occupational Medicine Group medical station or hospital. Medical examination of Laboratory employees by the Occupational Medicine Group is mandatory for work-related injuries. Contractor employees must go to the nearest private hospital.

Notify the reservoir authorities and the group office in a timely fashion. The **group leader** will notify the Safety & Risk Assessment Group and the health and safety division office or the Emergency Management Office (EMO) at 667-6211. If the injury occurred in a vehicle accident, the group office also notifies the local police department

Boating Accident - Notify the reservoir authorities and the group office in a timely fashion. The group leader will notify appropriate Laboratory organizations such as the division office or the Laboratory Emergency Response Coordinator.

Overdue Personnel - If an employee is overdue during working hours, the employee's supervisor will notify the group office.
During or after working hours, the supervisor will notify the group leader or designee if the employee is missing.

The group leader or designee will verify, insofar as possible, the known circumstances and conditions of the employee's absence. The group leader will notify the division office and make a recommendation for action to be taken, including contacting the New Mexico State Police (which coordinates search and rescue).

Launching and retrieving the boat or raft

Steps to launch the boat or raft

To launch the boat or raft, perform the following steps:

Step	Action
1	Inspect all safety equipment and make sure every piece is accounted for. Equipment is listed in previous chapters *Preparing for a sampling trip* and *Boat and Raft descriptions*.
2	Remove the tie downs from the boat.
3	Operator puts on approved life vest and gets into boat.
4	Driver backs the trailer down the ramp until the trailer bunks are under the water.
5	Operator starts the outboard motor and allows to warm up.
6	Driver unhooks the safety chain from the bow of the boat.
7	Driver removes the winch hook from the bow of the boat.
8	Operator shifts the outboard engine into reverse and powers off the trailer. (If the boat will not back off the trailer, backing further into the water may be necessary.)

Steps to retrieve the boat or raft

To retrieve the boat or raft, perform the following steps:

Step	Action
1	Driver backs the trailer into the water to the same depth that was sufficient to float the boat when launching.
2	Pass safety line from boat to second person on shore.
3	Operater drives the boat carefully onto the trailer.
4	Attach winch chain and pull boat onto trailer.
5	Shut off engine and properly secure it for transport.
6	Attach all safety straps and tie-downs.

Records resulting from this procedure

Records There are no records generated as a result of this procedure.

HAZARD CONTROL PLAN

1. The work to be performed is described in this procedure.
"Boat and Raft Safety"

2. Describe potential hazards associated with the work (use continuation page if needed).

Hooking and unhooking trailer -- Pinched fingers, smashed feet, or hit by shifting trailer.
Towing trailer -- driving hazards associated with pulling a trailer: backing up, turning, trailer coming loose while driving.
Animal Injuries- (snakes, spiders, mountain lions, etc.)
Weather—Lightning
Boat/raft accidents
Drowning
Handling heavy objects (loading/unloading/transporting/postioning)
Falls/tripping – uneven terrain, carrying awkward objects or equipment
Fuel spills, fires. Fuel can be spilled on the hot engine and start a fire. Storage and transportation of fuel creates risks of spillage.

3. For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, as determined according to LIR300-00-01, section 7.2)

Hooking and unhooking trailer -- occasional / critical = medium.
Towing generator -- occasional / moderate = low.
Animal Injuries- (snakes, spiders, mountain lions, etc.)—remote/critical = minimal
Weather—Lightning—remote/catastrophic = low
Boat/raft accidents—improbable/catastrophic = medium
Drowning—improbable/catastrophic = medium
Lifting and moving heavy items—occasional/moderate = low
Falls/tripping—occasional/moderate = low
Fuel spills, fires: occasional / critical = medium

Overall *initial* risk: ☐ Minimal ☐ Low ☒ Medium ☐ High

4. Applicable Laboratory, facility, or activity operational requirements directly related to the work:
☐ None ☒ List: Work Permits required? ☒ No ☐ List:

LIR-402-706-01 "Personnel Dosimetry"
29CFR1926.500, Subpart M, Section 502, "Fall protection"

HAZARD CONTROL PLAN, continued

5. Describe how the hazards listed above will be mitigated (e.g., safety equipment, administrative controls, etc.):

Hooking and unhooking trailer -- The trailer hitch and the truck receiver must be properly matched and engaged. The trailer safety chain must be attached to the vehicle. Use the trailer tongue jack for raising and lowering the trailer tongue. Keep hands and fingers clear and watch for sudden movement. Chock BOTH trailer wheels for any hooking and unhooking operations.
Towing generator -- Attach trailer safety chains to the vehicle. Use extra caution while towing the trailer; watch the mirrors when turning; be aware of the extra width and length of the vehicle. Stopping distances are significantly increased.
Animal Injuries – Read the "Field Safety for All" document and use common sense to avoid these types of injuries.
Weather (lightning) -- Read the "Field Safety for All" document and seek shelter when necessary.
(See continuation page.)

6. Knowledge, skills, abilities, and training necessary to safely perform this work (check one or both):

☒ Group-level orientation (per MAQ-032) and training to this procedure.
☒ Other → See training prerequisites on procedure page 3. Any additional describe here:

7. Any wastes and/or residual materials? (check one) ☒ None ☐ List:

8. Considering the administrative and engineering controls to be used, the *residual* risk level (as determined according to LIR300-00-01, section 7.3.3) is (check one):

☐ Minimal ☒ Low ☐ Medium (requires approval by Division Director)

9. Emergency actions to take in event of control failures or abnormal operation (check one):

☐ None ☒ List:

For all injuries, provide first aid and see that injured person is taken to Occupation Medicine (only if immediate medical attention is not required) or the hospital..

Signature of preparer of this HCP: This HCP was prepared by a knowledgeable individual and reviewed in accordance with requirements in LIR 300-00-01 and LIR 300-00-02.

Preparer(s) signature(s)	Name(s) (print) /Position	Date

Signature by group leader on procedure title page signifies authorization to perform work for personnel properly trained to this procedure. This authorization will be renewed annually and documented in ESH-17 records. Controlled copies are considered authorized. Work will be performed to controlled copies only. This plan and procedure will be revised according to MAQ-022 and distributed according to MAQ-030.

HAZARD CONTROL PLAN, continued

Hazard Control Plan continuation page. Give item number being continued.

5. How Hazards are Mitigated:

Boat and raft accidents—Review a copy of the "New Mexico Better Boating and Regulations" (published by the New Mexico Parks and Recreation Bureau of Boating Safety).

Drowning—All participants must know how to swim and must wear life jackets at all times while on board the boat/raft.

Handling heavy objects (loading/unloading/transporting/postioning)—Use proper lifting techniques. Falls/tripping – Read the "Field Safety for All" document on awareness of trips, slips, and falls.

Fuel spills, fires: When refueling: Only do refueling OUTDOORS and AFTER the engine has cooled for at least 5 minutes. Carry gas in approved safety gas cans -- MAXIMUM 8 gallons – only in outside beds of vehicles, or in trailer if fuel lines disconnected. Wear safety glasses when refueling. Check engine oil at each refueling. Leave MAX of 17 oz in engine fuel tank.
When filling gas cans: Always put the can ON THE GROUND when adding gas. Cans in the bed of a truck, especially one with a bed liner, are often not grounded and a spark can occur between the gas nozzle and the can. Many fires have occurred this way.